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Exploring the role of acquisition in the performance of the firms: is the "firm" the right unit of analysis?

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Using plant- and firm-level data taken from the Longitudinal Research Database (LRD), we examine how the unit of analysis affects conclusions about the performance effects of mergers and acquisitions. We find that (1) acquisitions have a positive effect on acquiring firms' productivity growth, (2) measurement error obscures this effect when analysis is based on firm-level observations for large, multi-unit firms, and (3) the measurement error derives from composition effects associated with changes in the structure of the activities undertaken by large acquiring firms. While strictly applicable to only food industry firms, the picture of an acquiring firm that emerges is one of efficiency and continuous adjustments in scope and structure. We conclude that there are good reasons to suspect that studies using large, multi-unit firms — the type of firm that dominates the samples of most studies of mergers and acquisitions — will be subject to large aggregation bias in firm-level regression analyses. (JEL D92, G34, L66).

THE ROLE OF FRENCH AND FOREIGN ENTERPRISE GROUPS IN FRENCH PRODUCTIVE SYSTEM INTERNATIONALIZATION 1983-93

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The foreign trade and unemployment analysis stresses ordinarily an opposition between the exports of developed countries - specialized in products with a high content of skilled labor and generating fewer jobs - and their imports - specialized in products with less skilled labour and generating more jobs Enterprise groups can act transversally to countries, crossing the frontiers of comparative advantages, by operating different kinds of transfers because of their affiliates. The role of these transfers is being transformed deeply, by what could be called the "informational revolution". We analyze changes in the structure of value added transfers involve by foreign trade between countries, according to the kind of control of enterprises (independent, controlled by a group), their size and the nationality of the group. We link that to the "product'activities mix" underlying. These different international involvements lead us to question different kinds of connections to French territory. What kind of effects are perceptible on financial results (profitability, efficiency, productivity, added value, foreign trade, etc.) and employment, considered as resources more or less disposable for national and human

development? To what extent can we cluster units according to traded products, to partner countries or to their kind of activities realized on national territory? The study uses individual business data from French statistical public system - accounts and employment (Suse), business groups links (Lifi) and foreign trade (Customs) for 1983 and 1993.

ENTERPRISE GROUP: THE FRENCH METHODOLOGY AND RESULTS

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The need for statistical data about enterprise group is increasing. For example, globalisation, mergers and demurrers cannot be analyzed at the enterprise level. Moreover, groups seems to control a major part of the productive system. French public statisticians do not use consolidated accounts in building statistical data about enterprises groups. They survey the most important shareholders among the enterprises and ask them about their subsidiaries and participations. This information allows them to identify « head of enterprise group », which control at least one other enterprise and is not controlled. An algorithm links the head with the set of its controlled enterprises. Accounts and balance sheet of individual enterprises are used to compute statistics. In 1995, 6800 heads of group, controlling 35000 French enterprises are so registered employing about 45% of the salaries of French enterprises and representing between 213 and 3/4 of operating profits. During the last decade, the number of enterprises groups and the number of controlled enterprises grew up by four. So, nowadays, the proportion of enterprises included in an enterprise group is about 100%, for the largest enterprises (over 500 employees) and over 50%, for the enterprises between 200 and 500 employees. As regards, in the medium enterprises, from 20 to 199 employees, the proportion is about 10%. The list of heads of group and controlled enterprises is built up year after year. An important question is the continuity of the enterprise group. The continuity of the head is not a good criterion because the enterprise « head of the group » may change without any change in the group. The basic idea is to identify the most important activities of the enterprise group. If from one year to another, this list does not change, the enterprise group will be continuous. If not, even if the head of group and some enterprises are present both years, the group will be closed and a new one opened. A strong continuity is presumed if both the most important activities and the most important enterprises remain identical. This algorithm is included in the ad hoc software since 1994. The first uses indicate that, in some cases, it is necessary to check manually because the result can drop out of the common sense.

INTEGRATION OF INFORMATION ON ENTERPRISE GROUPS

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In the economic research, both theoretical and applied, the role of 'enterprise group' as such is recently being appreciated; the group is intended as a set of enterprises (juridical units) joined together, in the exercise of their production activities, by the reference to the same top management of decision and control, i.e the subject where entrepreneurial

activities are centralised. As a matter of fact, relational structures of control between enterprises determine economic subjects that go beyond the juridical borders of legal units; such entities take shape when the productive resources of more enterprises are grouped under the control and management of the same entrepreneurial figure. The (hierarchical) group of enterprises is defined, for statistical purposes, as a set of juridically independent enterprises that are subject to the direct or indirect control of a unique 'vertex', the physical or public body that is at the summit of the hierarchical structure of control; the holdings are enterprises at the top of the hierarchy of control and are directly controlled by the vertex. The organizational pattern of the group evolves the model of multi-divisional large enterprise; the organized set of enterprises is assimilable to an unique economic actor. Even if constituted by a multitude of subjects, often juridically independent, the enterprise group looms as the reference economic agent, the analysis unit that is derivable by the observation entities (juridical enterprises), in fact such plurality of enterprises forms a whole with coherent and unitary behaviour (economic enterprise). The interest for surveying group structures raised, at Istat, during the co-operation with Eurostat at the production of data for the analysis of globalisation, as well as in view of setting-up a business register (ASIA) that shall also comprehend some information about the relationships between its units, especially in terms of control. Exhaustive and systematic group data are not yet available but, apart some surveys carried out by Istat and other organizations, there are some administrative sources, namely Uic (foreign currency exchange authority) and Consob (body that ensures the transparency of the operations of societies in the stock market), useful to build-up and maintain a statistical archive of enterprise groups. In order to control operations of societies linked to the stock market, Consob keeps a database with very detailed information, about relations and structures of ownership and control, for the enterprises 'close to the stock market'. As to control external trade, Uic records a set of data that could feed an information system on enterprise groups, especially for that concerns multinational groups and relations with foreign countries. Other sources (antitrust authority, balance sheets, databases...) are under analysis in view of their utilization for a databank from integrated inputs. A collaboration with Eurostat (FATS project, multinational groups statistics) showed the feasibility of the integration -within Istat and with other external sources- of data on enterprise groups as to obtain acceptable levels of information: a first dataset containing about 3700 enterprises (domain: enterprises with more than 50 persons employed in the trade sectors), for which only in 14% of the cases the information concerning inclusion into groups and -if so- the localisation of the vertex was available, has been integrated by data from Istat surveys and from Uic raising the percentage of coverage to 73% (data from Consob were not yet available). An experiment for setting-up an archive of enterprise groups in Italy is undergoing at Istat; such information will feed the business register ASIA. In conclusion, it seems possible to build-up and maintain a base of information on enterprise groups by the integration of statistical data and information from administrative sources.

MYTHS AND REALITY ABOUT EMPLOYMENT AND SMES IN FRANCE; THE ROLE OF ENTERPRISE GROUPS (1984~1992)

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A Longitudinal Database (LDB) was constituted, at Insee, of French business data from SUSE system. This LDB is near to be macro-economically representative on its field (13 millions of employees on 13,5 concerned). 1. The Small and Medium sized Enterprises (SMEs) cannot be statistically defined by a simple reference to their characteristics a given year when a longitudinal analysis is conducted, for we obtain a significantly distorted image of temporal changes and of their meaning. 2. The different sets shift intensively both in extent (creations/disappearances) and in content (size class, control, ownership, ...). The changes of links between reported units are of major importance. The role of group structure, i.e. financial links between enterprises, appears as crucial. This questions on relevancy of fields and populations definitions for a given longitudinal analysis of enterprises. 3. This question on the engine of the employment dynamic, usually attributed to SMEs. First, the SMEs controlled by a group at the end of the period seem to be more dynamic, as regard the employment, than those stayed independent. But, this seems to be mostly due to the shifting of independent SMEs towards the control of a group. During the same time the set of SMEs rejected by groups contributes negatively to the employment growth. So, the contribution of groups to this dynamic appears more complex. This should involve a reflection about how the group structure answers to the need of the sharing of resources between enterprises.

INTERNATIONAL COMPARABILITY AND QUALITY OF STATISTICS

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The concern for the quality of statistics has grown rapidly during the last decade, and is now quite wide spread among national and international statistical offices. Spatial and particularly International Comparability is one of the components of the quality concept, recognised both by national and international organisations (Champsaur (1997) and UN (1983)). Unlike the other components (accuracy, relevance, accessibility, timeliness, coherence, comparability through time) - Eurostat (1996a) - for which many theoretical and applied work has been conducted, the situation for international comparability is less favourable. The existing work is classified in the paper into three categories: - a uniform approach used by some international organisations to conduct surveys (Kish (1994)), which consists in designing exactly the same survey in several countries - a "meta-data" approach, put in place in particular by Eurostat more than a decade ago, to document with many details all discrepancies between national statistical production processes, statistic by statistic (for instance Eurostat (1997)) - a "subsidiarity" approach, which consists in adopting common definitions of the statistics to be produced, either with few or no constraint on the production process or the level of quality achieved (for example UN 1993) or with the obligation to report on quality (Eurostat 1996b). We show then that the concern for quality requirements in the international comparability leads to develop a

system based rather on micro-data than on aggregate statistics, supporting the view expressed by Laaksonen (1995 and 1996). Building on this, we develop the model approach of international comparability and propose a system of international network to tackle the issue of confidentiality of micro-data, showing the possibility to decentralise most econometric procedures. A method for considering both sampling errors and estimation error in the model is developed in Bienvenue et al.(1997).. We propose as well an approach to robustness and sensitivity analysis for international comparisons and consider the consequences of international comparability on the equity of the fulfilling burden for businesses.

SAMPLE DEPENDENCE: THEORETICAL ASPECTS AND ILLUSTRATIONS

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Extending a suggestion by Laaksonen (1996) on the centralised treatment of multinational surveys, our idea is to assess the influence of the sample on the conclusions. We have specified 8 two-step logit model on a multinational survey, we face then another issue to ensure the consistency of any comparison: how dependent of the sample are the estimates and therefore the conclusions? Our conviction is that one should be extremely cautious when drawing direct conclusions from sample based multinational surveys. This paper tries to highlight the influence of the sample on simple indicators but especially on econometric relations. Usually in an econometric equation the standard error is defined with respect to the model. The basic idea of this paper is that sample based relations depend both on the model and the sampling scheme. The theoretical framework is based on an interpretation of the model approach. Indeed superpopulation models allow to take into account the influence of the model and those of the sample in an econometric relation. Econometric relations are considered here as the result of a two-step approach: 1. First, the model is defined in the superpopulation, it represents the underlying process or the causal relations between the dependent variable and the regressors. The finite population comes from a random draw from the infinite superpopulation, then an uncertainty, due to the fact that only a part of the superpopulation is considered, appears. This is the model uncertainty (and this implies a variance with respect to the model) that will be denoted with the subscript e . 2. Secondly, the model is usually estimated on a sample drawn from the finite population. Thus a second uncertainty appears due to the sampling scheme. This sample uncertainty (consequently it exists a variance with respect to the sample) will be denoted with the subscript r . Practically one will use for the calculations data from a European-wide survey measuring the impact of the Single Market implementation: the Eurostat Single Market Business Survey (1996). A decomposition of the variance will be calculated using data from the Single Market Survey, having written the analytical form of the variance the calculation will be carried out with the bootstrap method. Besides, the sample dependence will be illustrated for indicators with panel data, using the bootstrap method.

The indicators will be calculated for every replicated sample. Provided the replicates mimic the finite population one will be able to examine the distribution of possible indicators from a sample and their variability.

TECHNOLOGY, PRODUCTIVITY AND EMPLOYMENT; INSIGHTS FROM FIRM LEVEL DATASETS IN FRANCE, JAPAN AND THE U.S.

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This paper presents the first results from internationally coordinated micro data analysis of France, Japan and the U.S.. An aggregated statistics shows the significant cross country difference in labor productivity and employments. Based on firm level datasets of manufacturing sectors, authors provide a micro level evidence for possible factors behind the difference in macro performances. Particularly, this paper addresses technology's role in productivity and employment growth. It is common for all three countries that R&D firms are likely to be successful upsizers (both labor productivity and employment grow), while non R&D firms are likely to be successful downsizers (labor productivity grows by employment cut). In this sense, the difference in macro performance comes from the distribution of firms by its size, industry and R&D intensity. Alongside of such descriptive statistics, research and policy implications are also provided.

ON SOME INDICATORS FOR MONITORING A SURVEY

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Quality of information is strictly related to a number of factors which are linked to methodological and operative decisions taken during the process of collecting microdata. The different steps of this process influence the quality of microdata and consequently of the information collected. The aim of this paper is to propose a way to evaluate the quality of data by monitoring each step of data collection through the use of indicators. Within the paper are also provided measures for "efficacy" and "efficiency" of a data collection processes. Efficacy is defined as the capacity to gather most information during a search, and efficiency is defined as the capacity to gather information at the minimum and in the shortest time. Quality indicators defined in terms of efficacy and efficiency can be applied to control either overall quality of the information collected or the quality of the information collected at each step. The use of such indicators by research responsables, control organisms or users of microdata is one way of ensuring the transparency of information that is of primary interest to the international community today.

A STATISTICAL INDICATOR FOR MONITORING MICRODATA QUALITY

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The quality of the information depends on a series of conditions relevant to the operative and methodological choices relative to the whole process of production of statistical data. In particular, the reliability of the final data is decided by the efficiency of the single phases of the productive process, even if the preliminary condition, till it is achieved, depends on the quality of the microdata since it's the base of the elaboration of the most complex data. Often for time and cost reasons, it is not possible to carry out all the tests on each phase, therefore the tests are concentrated on the initial part of the production phase, the data collection. This represents the most significant operation from where the basic information (microdata) comes from. This allows to limit and correct in great part the so called "collection of error samples". Based on the experience regarding the ISTAT research on the economical accounts of the companies with 1-19 employees, the present work faces the problem of the microdata quality proposing as a real instrument of optimization of the productive process, the elaboration of the survey models. These are simplified and differed by activity groups and built in order to respect the characteristics of different types of companies interviewed. In particular the analysis uses the elaboration of a specific statistic indicator: "the coefficient of impact". This indicator by measuring the "unwillingness" of the company interviewed in answering the questions of the survey model, wants to verify the relevance of the above questions to the "answering company" economical activities and their importance in determining the final information to be produced. By using this indicator it is possible to highlight some questions not suitable to the characteristics of the interviewed company and therefore adjust the model "ad hoc" for the company.

DYNAMIC LABOUR DEMAND MODEL FOR HETEROGENOUS PANELS

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The purpose of this paper is to study the problem of estimating an econometric model on heterogeneous dynamic panels. The traditional panel procedures such as the fixed and random effects estimators which pool the data and impose slope homogeneity can be very misleading in this case. A test for heterogeneity, using for example Hausman type tests, is important but not sufficient. In particular, Pesaran and Smith (1995) show that when the number of time-periods is small (even if the number of individuals is large), the unmodelled slope heterogeneity yields in general inconsistent estimated coefficients. The application of methods such as Instrumental Variables (IV) or Generalised Method of Moments (GMM) to a pooled model is applicable if two conditions are verified. First, instrumental variables must not be correlated with the disturbances. Secondly, they must have a non-zero correlation with the included regressors. Some instruments suggested by

Arellano and Bond (1991), Arellano and Bover (1995) can be used for estimating heterogeneous coefficients under some conditions. This problem is illustrated by estimating industry-specific labour demand model using panel data for eleven countries. This paper is organised in three sections. The general framework is described in a first section. We retain a dynamic labour demand model based upon the assumption that adjustment cost are continuous functions of employment variations, and under the rational expectation hypothesis. Following Nickell (1986), and to use the Generalised Method of Moments estimation technique, a dynamic employment equation is deduced from a log-linear approximation of the Euler equations. The basic estimating equation is defined by an unrestricted vector auto-regressions (VAR's) where short-run effects and long-run effects are respectively represented by lagged endogenous variables and by lagged exogenous variables. In order to consistently estimate the dynamic employment equation, we use predetermined variables as valid instruments. This procedure proposed by Arellano and Bond (1995) is described in a second section. Using Eurostat Panel of Entreprises, econometric results are reported in section 3. Two approaches are considered: First, under the homogenous parameter assumption, we estimate the labour demand model independently on each country panel data; Secondly, under the heterogenous parameter assumption, the model is estimated by a pooled fixed-effects estimator across eleven countries (or eleven panel data). The difference between these two procedures will enable us to illustrate the presence of a bias when the heterogeneity of the parameters is ignored in the pooled regressions.

PRODUCTIVITY AND SPECIFICITY IN FACTOR INPUTS

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This paper evaluates the macroeconomic importance of specificity in factor markets by considering the effects of wage moderation in the Netherlands on productivity growth since 1982. The analysis is based on vintage model of capital with embodied technology. In a traditional vintage model, a decline in wages relative to cost of capital will delay scrapping and postpone new investment, thus reducing productivity growth. In recent models which take into account the specific production relationship between capital and labor and the problem associated with appropriability of rents, institutionalized wage moderation will increase new investment and improve productivity. A preliminary analysis of micro-level data of industrial firms does not yet lead one to reject the role of specificity.

THE EFFICIENCY OF INDUSTRIAL FIRMS: A PANEL DATA ANALYSIS ON FRENCH FIRMS.

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It is often said that firms can improve their workers efficiency by setting an efficiency wage policy. Indeed, direct tests of the efficiency wage hypothesis, which amount to

including a function of the relative wage in the firms production function, do not reject it (cf. Wadhvani et Wall (1991), Levine (1992) and Blanchard, Cayatte and Sevestre (1994)). The question we want to address in this paper is to analyse the impact of such policies on the relative efficiency of firms. Are firms which apply an efficiency wage policy more productive than others, other things being equal ? Or, does such a policy allow (otherwise) less productive firms to reach the same level of efficiency as more productive ones. In order to answer this question, we shall estimate production functions as well as production frontiers either including an efficiency wage argument or not. We shall consider two types of production functions: a Cobb-Douglas one and a Translog one. The advantage of the former is its strong simplicity while that of the latter is that it allows more flexibility in the representation of the production technology; it also allows to take into account firms heterogeneity in a better way. These estimates will allow us to compare firms efficiency and to assess the impact of an efficiency wage policy on it. The sample we use is an unbalanced one, made of more than 300 French firms observed each year between 1978 and 1988. Due to the possible endogeneity of some of our regressors, these models will be estimated by the Generalized Method of Moments or the Maximum Likelihood method.

PRODUCTIVITY, COMPETITION, FINANCIAL PRESSURE AND CORPORATE GOVERNANCE - SOME EMPIRICAL EVIDENCE

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In this paper we examine the influence of three categories of factors external to firms competition in the firms' product markets, the financial pressure on the firms, and their corporate governance structure - on the productivity performance of approximately 2.500 Danish firms in a longitudinal sample covering a 5-year period, 1989 - 93 . Following Nickell (1996) and Nickell, Nicolitsas and Dryden (1997) we estimate a production function (the "technology") augmented with industry dummies to pick up differences in technological opportunities and other unobserved industry specific factors, size and age of the firm, and variables capturing differences and changes in product market competition, ownership structure and control, and capital structure and debt of the firm. The purpose of the empirical analyses is to provide some evidence on the primarily theoretical literature on the effects of competition accounting for differences in financial pressure and ownership control. Moreover, we are also interested in whether the effects of competition differs between firms with little and heavy debt payments services, between owner-controlled and other firms, small and large firms, young and old firms.

INVESTMENTS IN INFORMATION TECHNOLOGY AND ORGANIZATIONAL RESTRUCTURING: FIRM LEVEL RESPONSE TO RECENT LONG DEPRESSION OF JAPANESE ECONOMY

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Japanese economy had experienced a long and deep depression from 1991 to 1994, which triggered a significant change in corporate structure in Japanese firms, toward more efficient and flexible organizations. In addition, advancements in information technology accelerates such organizational changes. This paper provides micro level evidences on organizational changes, use of information networks and productivity, based on the firm level survey data by Japan Productivity Center for Socio-Economic Development (JPC). In general, organizational changes by using IT facilitates faster productivity growths. However, its impacts on employment depends on the type of organizational changes.

ESTIMATING THE EFFICIENCY OF THE ITALIAN BANKING SECTOR VIA COST FUNCTION: A PARAMETRIC APPROACH

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The purpose of this application is to estimate the current efficiency of the Italian banking sector using 1995 balance sheets and income statements data, relative to 89 Italian banks. The efficiency analysis is carried out through a parametric approach that is representing the banking production process by a cost function in the form of a Cobb-Douglas, but also of a Translog. These functions permit to estimate the cost efficient frontier and the individual economic efficiencies measured by the distance of each observation from that frontier. Estimation procedure is conducted on a Cobb-Douglas and a Translog cost stochastic model which is characterized by the assumption that the error term is composed of the sum of two components: the first component, being one-sided, reflects the economic efficiency, while the second one, being normally distributed, reflects random errors, that is factors outside the firms' control. The results of the analysis are compared to previous analyses of Italian banking efficiency in order to verify if the Italian banking sector has become more or less efficient than it was in the past and if the hypotheses made by previous studies about the kind of functional form adapt to represent the banking production technology are still acceptable or not.

PARAMETRIC ESTIMATION OF TECHNICAL AND ALLOCATIVE EFFICIENCIES AND PRODUCTIVITY CHANGES: A CASE STUDY

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This paper reports about the estimation of technical and allocative efficiencies and productivity changes for a panel of 18 Dutch rubber-processing firms over the period 1978 - 1992. The estimation method is a parametric one, implementing the approach outlined by Balk (1996). Several model variants are estimated and the effects of misspecification are shown. The results are also compared to the outcomes obtained by a DEA method. It appears that different models lead to different results.

CREATION AND HANDLING LONGITUDINAL DATA ON FINNISH MANUFACTURING

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The paper considers the creation of the longitudinal data file derived from the Finnish cross-sectional manufacturing censuses for 1990 to 1994. These censuses cover all the establishments larger than 5 employees. The statistical unit of these censuses is an establishment but we have constructed the group of the manufacturing establishments in order to follow these (partly) artificial enterprises over time using a cohort principle. Since the micro enterprises are missing from the 1990 census, we also picked up from the business register such units, the size of which exceeded 5 employees until the year 1994. The creation of this longitudinal data set was not in many cases easy because of demographic changes during the period. Some lacks of the data files also required a specific treatment. The paper first discusses the methods for the creation of the longitudinal data file. Secondly, it presents the results of demographic events, both for original enterprises and for artificial ones. Thirdly, we analyse the success of these enterprises.

FACTORS OF PERFORMANCE BY PLANT GENERATION. SOME FINDINGS FROM FINNISH MANUFACTURING

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The importance of technology generation, learning by doing and spillovers for the performance level is studied in this paper by using plant-level panel data set from Finnish manufacturing. A multilateral total factor productivity indicator that incorporates both the efficiencies of labour and capital usage is used as the independent variable. The analysis covers the periods from 1975 to 1984 and from 1981 to 1994. It appears that the new generation plants have superior potential over the others. However, some potential seem to be under-utilised at the first stages of the life cycle. The total factor productivity level

im-proves especially rapidly among the newest plants. Learning by doing provides one explanation for this findings. The new plants are established relatively more frequently by high productivity kind-of-activity units than by low productivity units. However, the relationship with the productivity level of the corresponding kind-of-activity unit seem to weaker among the new generation plants than among the older plants. Indications from regional spillovers are obtained too. A plant's pro-ductivity is positively related with that of the other plants in the same region especially among the very new generation plants and, moreover, among the quite old generation.

EFFICIENCY AND OPTIMAL SIZE ESTIMATION WITH PANEL DATA: THE CASE OF BUSINESS SERVICE AND BUILDING SECTOR IN ITALY

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The aim of this study is to evaluate some aspects of the efficiency performance of the Italian enterprise over the period 1989-94. In particular we concentrate the analysis on two main groups of private sector companies which were not considered (Corsini, Monducci Vicari 1997): - building sector (Nace F); - business services (Nace K), that includes, for example, information technology, research and development. The database we use is represented by a panel of enterprises taken out from Istat "System of the Enterprises Accounts" annual survey about all Italian enterprises with 20 or more employees. The panel data apply to a period starting from 1989 till 1994. We focus the study on the measurement of efficiency and estimation of a frontier production function, using some recent methodological results in the literature (Cornwell, Schmidt, 1995). Within this framework we investigate the possible existence of different levels of optimal "size" between the two sector and their evolution during the period. In particular we test the hypothesis that in the building sector the efficient size is bigger than in the services sector. That is important for Italian structure of business; in fact in Italy the small enterprises represent a bigger share in employment creation, turnover, etc. than other European countries. A measure of efficiency for the enterprises operating in Nace F and K is also important in order to evaluate the competitiveness of the Italian enterprises in those sectors.

INFORMATION CONTENTS OF BALANCE SHEETS FOR QUANTITATIVE ANALYSIS OF INDUSTRIAL DISTRICTS

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As it is recognized, even if plentiful, literature on Industrial Districts is not characterized by a quantitative framework (Signorini, 1990). Poverty of official information at

microarea level has been advocated as chief cause of this pitfall. Starting from this lackness of official statistics the aim of our paper is to put in evidence potentialities of Balance Sheets Registers for statistical analysis of these important industrial realities. The paper results to be divided in two sections. In the first we analyze the four chief Registers of Balance Sheets, available quite easily, at a District level: - Finance Registry Office; - Cerved; - Industrialists and Craftsmen Associations (which include also Books of Depreciation Commodities); - Industrial Accountancy Registers of whom are endowed the few large firms of the District. For each of these Registers we discuss the problem of their time and internal consistency (error profile). In the second section of the paper we aim at building a map of the possible streams of research to feed through the statistical and economic contents of Balance Sheets. We develop our analysis both looking at the existing literature based on Balance Sheets and at the possible links with other Registers. We discuss connections between Balance Sheets and these chief topics of research; A) National Accounts: direct evaluation of gross product and construction of Patrimonial Accounts at microarea level; B) Investment and capital stock evaluation through Depreciation Books; C) Scale Economies and Efficiency; D) National and International comparison of Financial Structure, E) Labour Demand and Financial Structure; F) Forecast of bankruptcy ("Distress Analysis")

EFFICIENCY AND LOCALISATION: THE CASE OF ITALIAN DISTRICTS

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The relevance of industrial districts in the Italian economic structure has been recently quantified by Brusco and Paba (1997) who show that about 30 per cent of employees in manufacturing are concentrated in areas characterised by the presence of industrial districts. However, despite the large interest devoted to the subject by the literature, the factors underlying the successful performance of firms which are part of industrial districts are scarcely analysed from an empirical point of view. Recently, Signorini (1994) has provided a quantitative comparison between firms belonging to two textile districts and those in the same sector not belonging to any district. The aim of this work is to generalise the comparison by considering all manufacturing sectors and, as far as available data allow, all Italian districts. The analysis is focused on the quantitative measurement of technical efficiency in order to investigate whether the successful performance of firms within districts is due to organisational factors such as the efficient use of inputs and technology or to causes which are external to the structure of organisation. The data used for this purpose are the balance sheets of a panel of small and medium sized manufacturing firms from the Centrale dei Bilanci database. The identification of industrial districts utilises, among other things, the procedure developed by Sforzi and Istat in 1996, based on the sub-provincial aggregation of areas in the so-called "local labour markets". The empirical analysis is carried out by using parametric and non-parametric measures of technical efficiency.

GROUPS, SME AND TERRITORIES: A STATISTICAL TYPOLOGY OF THE LOCAL INDUSTRIAL STRUCTURES IN FRANCE

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In this paper, we aim to analyse through a statistical study the local features of the French industrial system. On the overall map of France, we try to recognize typical economic organizations and their underlying territories, such as the areas dominated by an important conglomerate, or on the country, those with a tissue of small and medium enterprises (SME) or other configurations. We first intend to describe the territories by the size of the firms which are set up in them. We made up a file with all the local units set up in France (around 2,4 millions local units in 1995). All these local units are recorded in the SIRENE register, which is managed by the INSEE. Of each local unit we particularly know the address, the activity, and the number of people employed. We also intend to appreciate the degree of autonomy of the local productive systems. So we have to identify the units which control the local units. In France, the legal unit, juridically autonomous is called the enterprise. Some enterprises may be connected by financial links and constitute an enterprise group. Though these enterprises are juridically autonomous, the group forms a whole for its economic evolution. An enterprise which is controlled by a group is not able to choose alone its strategy. Thanks to the data produced by the French statistic system, we are able to link the local unit to the enterprise which manages it. We can also reconstitute the groups. The SIRENE register links the local units to the enterprises. Concerning the groups, the INSEE holds a yearly survey about the financial links between the enterprises (LIFI survey). Moreover, the foreign companies which invest in France have to declare their investments to the French Treasury. Processing all these data, we have evaluated the proportion of the different forms of productive units in the French industry and drawn up a typology of the « employment areas». These areas are the result of a geographic partition used by the French administration. On the overall map of France, there are 348 employment areas. According to the industrial density and to the proportion of the different forms of units, our typology reveals 12 classes of areas. The first results corroborate general geographical features of France. Groups are mainly situated in the northern half of the country, on the north of a line from Nantes to Valence. The southern half of France is less industrialised. Only a few regions have both a high density of industry and a local autonomy of firms. This is the situation in the Bretagne, the Rhone-Alpes and the Nord-Pas-de-Calais. These types of densely industrialised areas with a local autonomy of firms probably represent a smaller proportion of employment than in other countries as far as we compare to other studies. In a second part of the paper, we try to evaluate the economic evolution of the different types of territories revealed by our analysis. From 1989 to 1994 the areas with a high density of regional groups and SME had a more favourable evolution of employment than the national average.

General introduction to the topic.

Benassi Marie-Paule

The current state of the exercise of the longitudinal studies on small and medium size enterprises in the EU member States

De Brabanter Eric

Eurostat's work programme on Longitudinal Enterprise data and Demography of Enterprises.

Benassi Marie-Paule

Micol Olivier

Mergers and demergers and demography of enterprises.

Ojo Edward

Lavallée Pierre

ECONOMETRIC ISSUES IN THE ANALYSIS OF LINKED WORKER-EMPLOYER SURVEYS

Hildreth Andrew, University of Essex

Pudney Stephen, University of Leicester

We consider the statistical problems involved in the econometric analysis of data from linked surveys of workers and employers. The context is a simple model of the incidence and duration of unemployment spells occurring between two waves of the UK New Earnings Survey, which have been linked to unemployment benefit records via the National Insurance number, and to Census of Production respondent firms via the Inter-Departmental Business Register.

DYNAMICS OF ITALIAN INDUSTRIAL FIRMS: MICROECONOMIC ANALYSIS OF PERFORMANCE AND LABOUR DEMAND FROM 1989 TO 1994

Bruno Giancarlo, ISTAT

Corsini Veronica, ISTAT

Monducci Roberto, ISTAT

The need to develop microeconomic analyses on the economic system stems, besides the necessity to deepen its structural aspects (efficiency differentials among the units; identification of classes of firms; analysis of wage dispersion; etc.), also from the acknowledgment of a high heterogeneity in the dynamic behaviours of the firms. In order to analyse the dynamic behaviour of Italian manufacturing firms over the period 1989-1994 - a period characterised, at a macroeconomic level, first by a recession followed by an expansion - we carried on some microeconomic analyses on a balanced panel of about 10000 firms with 20 or more employees. The source of the data is Istat System of the Enterprises Accounts Annual Survey about all Italian firms with 20 or more employees, which collects data referring to balance sheets. The data set was enriched with some structural information coming from 1991 Census of Industries and Services, mainly referring to different reclassifications of the sectors where the firms operate (economic destination of products and kind of technology for production). Another very important source is Istat Monthly Survey about Firms External Trade, which was integrated in the data set at the individual level, where possible. In fact the degree of international opening of the firms is a very important discriminating factor as far as efficiency, employment and profitability are concerned. This enables us to build a wide set of microeconomic indicators referring to geographical penetration of exports and to merceological diversification of export turnover. The aim of the paper is to analyse the relationship between firms performance and employment in terms of level and composition of employment, working hours and levels of wages. In particular, we concentrate on the dynamics of employment, referring both to different behaviours of firms over the business cycle, and to the dynamic interrelationships among employment, level of profits and persistency of profits.

THE INFLUENCE OF ADJUSTMENT COSTS ON LABOUR ADJUSTMENT AN ANALYSIS USING PANEL DATA FOR MANUFACTURING ESTABLISHMENTS IN LOWER SAXONY

Gold Michael, Lueneburg University

During the last years a number of studies investigated the costs of adjustment, the structure of adjustment costs and the influence of these costs on labour demand. Most of these studies used aggregate data at the level of industries while micro data based studies are still rare. One problem for empirical studies at the firm level is the lack of panel data

with a large number of cases and high quality of data. The following analysis of the influence of adjustment costs on labour adjustment is based on the Hannover Firm Panel, a new data set that is a representative panel covering some 1000 manufacturing firms from Lower Saxony, one of the German Federal States. The first three waves of the survey are successfully completed, field work for the fourth wave will be finished in the end of 1997. The survey covers establishments with at least 5 employees in 1994. The design of the survey allows an establishment-proportional weighing, so forecasts for all establishments of the manufacturing sector in Lower Saxony are possible. The survey is divided in different topics, e. g., general information of the establishments, structure and development of personnel, wage and salaries, determinants of employment, and information on about product and process innovation, determinants of imports and exports, and the establishment's environmental protection activities. The paper starts with a description of the change in the number of employees between 1993 and 1995 by firm size. After a theoretical discussion of adjustment costs with a focus on investments in human capital and the role of works councils, the paper presents results from an empirical analysis of labour adjustment and the role of internal factors of establishments which affect labour adjustment (works councils) investments in human and the role of works councils, the paper presents results from an empirical analysis of labour adjustment and the role of internal factors of establishments which affect labour adjustment (works councils, investments in human capital, overtime, short time, firm size and profit situation). It is shown that works councils, investments in human capital, short time and a bad profit situation increase the probability that an establishment has problems with "too many employees", or "too high costs for personnel reductions". Furthermore, works councils and investments in human capital decrease labour adjustment.

THE EVOLUTION OF WAGE FORMATION IN FRANCE : SOME RESULTS FROM INDIVIDUAL PANEL DATA OF TWO COMPANIES

Guillotin Yves, Université du Maine

The purpose of the paper is to try to use the « Mincerian » type of earning equation to model the evolution of the wage formation rules in France since the beginning of the eighties. The data come from two French companies : one in industry and one in services. Several hundreds of individuals are followed monthly over a ten year period. But the interest of the study is that the human resource management of the two firms underwent some major changes in the period covered by the data. An accurate study of qualitative changes carried out by means of interviews of manager of human resources and employees, allows us to know what the firm want to do. The estimation of earning equation is used to evaluate the efficiency of the human resource policy. Moreover, some statistical tests (Chow test) are done to check the structural changes of the way of wage formation within these two firms. The results are consistent with the usual effects of human capital variables. They also illustrate a high level of individual and temporal heterogeneity. These initial illustrations cannot be generalized to cover the country as a whole but they do seem to shed some light on the interest of pursuing this course of study. Consideration of « company » dimension cannot be reduced to an estimation of fixed effect models.

THE MEDIO-LARGE SIZED ENTERPRISES EVOLUTION (INVOLUTION) OF THE INDUSTRY AND SERVICES IN ITALY FROM 1986 TO 1995

Taccini Piero, ISTAT

Garofalo Giuseppe, ISTAT

The statistic data aggregate aren't very often sufficient to explain the difference of a population and especially their tendency, and in particular in the enterprises' range, the macro-aggregates don't explain the micro-difference of the enterprises and don't allow to identify microgroups or groups following several behaviours either in an only economic activity sector or in more sectors' combination. The paper has the objective to analyze the behaviour of the Italian enterprises with over 20 employees through a retrospective balanced panel (considers the events of merger and demerger in each year that the enterprises carried out in the period from 1986 to 1995) built by the help of the new enterprises register (NAI-SIRIO) that through an unique identified code allowed to indicate the same unit for the whole period concerned. Other data are deduced by the annual survey on the accounts' system of the enterprises with over 20 employees. The aim of the research is to identify these micro-groups or groups underlining, through the productivity the profitability and the creation or destruction of employment (GJC or GJD), the existing relations and connections among them in order to individuate same peculiar features. The productivity, stated by the business added value per employee, is the relation between the quantity of resources employed and the total result obtained, it gives a frame of the operative conditions concerning the relative efficiency aspect. The profitability, stated by the relation between the business added value and the turnover amount, specifies and justifies the efficiency levels of the economic conversion effected by the enterprise. The Gross Job Creation and the Gross Job Destruction indicators, are defined as the difference in employment between the time t and the time $t-1$ for a certain enterprise i . It can be also defined as the medium dimension of an enterprise that is its medium number of employed during the time t and $t-1$. $X(i,t) = \text{Employment}(i,t) + \text{Employment}(i,t-1)/2$. In this paper for a global valuation of GJC (res. to GJD) for the T period of the years examined has been used for the simple media of $GJC(t)$ (resp. $GJD(t)$) for the whole period: $\sum GJC(t)/T$.

Wage and Productivity Dispersion in U.S. Manufacturing: The Role of Computer Investment

Timothy Dunne, University of Oklahoma, Center for Economic Studies

John Haltiwanger, University of Maryland, Center for Economic Studies

Kenneth Troske, University of Missouri, Center for Economic Studies

A voluminous literature has developed recently documenting and analyzing rising wage inequality in the United States over the last few decades. There is widespread consensus that the observed changes in the structure of wages reflect changes in the relative demand for skilled workers. There is much less consensus about the reasons for the change in the demand for skilled workers. A leading candidate explanation is skill-biased technological change. Widespread anecdotal and somewhat more limited empirical evidence points towards the role of the information technology revolution. One limitation of the existing literature is that much of the empirical work exploits microeconomic data on workers that typically includes limited information about employers and the structure of the workplace. In this paper, we exploit plant-level data from the Annual Survey and Census of Manufacturers over the 1970s, 1980s and 1990s to document and analyze changes in the dispersion of wages and related changes in the dispersion of productivity across plants. The first part of the paper provides a detailed characterization of wage and productivity dispersion. In particular, we decompose overall dispersion in wages into within plant and between plant components. We also document and study the relationship between wage dispersion and productivity dispersion among plants. The second half of the paper investigates the role of observable plant characteristics in accounting for the observed patterns of wage and productivity dispersion. While we consider a wide range of plant observables, we focus our attention on computer investment at the plant-level. This focus is driven by the widespread perception noted above regarding the role of computers in the workplace. Simultaneously investigating wages and productivity permits a rich characterization of the impact of computers -- particularly, given that we exploit between plant variation in computer investment, wages and productivity over a long period of time.

ENTERPRISES AND LOCAL UNITS THE EVOLUTION OF FRENCH EMPLOYMENT

Hecquet Vincent, INSEE

Roualdes Danielle, INSEE

In this study we intend to understand the way in which the firms are constituted, that is to say the way in which their workers are distributed among the local units. In France, the enterprise is the productive unit which is autonomous from a legal point of view, for the accounts and the juridical personality. An enterprise may have several local units or one. Thanks to the data produced by the INSEE, we are able to link the local unit to the enterprise which manages it. The SIRENE register records all the local units set up in

France, and links them to the enterprises. Besides, the data base BRIDGE records specifically the big local units, and provides a more precise information, thanks to a yearly survey. The French statisticians have notably defined an economic continuity of the local unit, beyond the legal unit which manages it. So we can reconstitute with a good preciseness the evolution in the course of time of the enterprises and the local units. We may analyse for example the growth of an enterprise, distinguish between the increase of the employment in the existing local units and the settling of new ones. We may also record the transfers of local units from one enterprise to another one. The first results present the general features and the sectorial specificities of the configuration of enterprises. Among the 1.1 millions enterprises set up in France, those which have more than one local unit are very few (around 6%) These enterprises are obviously the biggest, and they employ 51% of the workers. If an enterprise has several local units, the biggest of them is indeed as big as a firm of the same sector which has one local unit. This main local unit regroups, on average, two thirds of the workers of the enterprise. We also analyse the evolution of the units size. During the last decade, the French enterprises have managed their employment and set up local units in very different ways. The industrial enterprises have reduced the employment and closed big local units. Conversely, the services enterprises have hired workers and set up many local units. As regards the trade enterprises, they have deeply changed the set of their local units closing the small shops, and opening new bigger ones. To understand all these changes, we have to keep in mind that some enterprises may be connected by financial links within business groups. In the French economy, the groups have a more and more important place. We have tried to take into account this new form of concentration, thanks to other data produced by the French statistic system.

RANK, STOCK, ORDER AND EPIDEMIC EFFECTS IN THE DIFFUSION OF NEW TECHNOLOGIES IN THE ITALIAN MANUFACTURING INDUSTRIES

Bartoloni Eleonora, ISTAT

Baussola Maurizio, Università Cattolica di Milano

The adoption of new technologies in the Italian manufacturing industry is analysed using data from the 1990-92 national sample survey set by ISTAT (Istituto Nazionale di Statistica). This survey includes almost 23000 firms from all manufacturing sectors, classified according to the ISIC standards. The analysis firstly underlines the main stylised facts of technological diffusion in the Italian industries. The determinants of technological adoption are analysed together with the main factors which restrain the introduction of new technologies. These patterns are then analysed in the econometric framework which is a general test on different theoretical explanation of technological diffusion. We specifically refer to four main mechanism affecting the use of new technologies: i) rank effect. This effect derives from the assumption that potential adopters have different and specific characteristics and, therefore, get different returns from the adoption of new technologies ii) stock effect. This effect is related mainly to the

so called game theoretic approach to the diffusion of new technologies. The crucial assumption in this framework is that the benefit to the marginal adopter decreases as the number of previous adopters increases. iii) order effect: this effect represents a generalisation of the stock effect and it may be rationalised using again a game theoretic approach, in that firms moving first exhibits advantages compared with later movers. Therefore, there will be a race to be first in the order to adoption. iv) epidemic effect. This effect deals with technological information which are acquired either through formal external sources or through internal contact with earlier adopters. The empirical model we set up is a logit (and probit) model which uses as explanatory variables proxies of the four different effects previously described. We can jointly test the significance of these effects and, therefore, have an overall test for the different theoretical approaches underlying the rank, stock, order and epidemic effects. The explanatory variables used as proxies for the different effects are: i) rank effect: firm size, firm status (e.g. independent firm or other), firm labour force skill, growth of firm output; ii) stock-order effects: sectorial R&D, sectorial labour force skill; iii) epidemic effect: sectorial number of adopters, sectorial number of firms using external information sources for the adoption of new technologies. The empirical estimates suggest that the main factors affecting technological adoption are crucially related to the rank and epidemic effects, while the stock and order effects do not appear as important as the previous effects in explaining the adoption behaviour of the Italian industrial firms. This result is consistent with previous empirical analysis on the diffusion of process technologies in other economies (e.g. the UK), suggesting that the rank and epidemic effects arise as the crucial mechanisms for the adoption of new technologies thus giving important insights for diffusion policies.

COMPETITION INDICATORS

Giorgetti Maria Letizia, ISTAT

The focus of this paper is an analysis of competition indicators based on a close link between statistical analysis and economic theory. In particular this paper tries to tackle empirical problems of estimating the growing competition level in the present process of assets privatization and market liberalization. The emphasis is put on the evaluation of the competition level in the markets and on the way National Institutes of Statistics can support, by means of their statistical items, this kind of analysis. The first step is to decide which are the most suitable indicators. This paper examines: 1) different theories of Industrial Economics from 1950 to 1990; 2) different competition indicators: the Lerner index, the Herfindhal index, other indices of concentration and an index of vertical integration. In order to calculate these indicators some problems could arise: for example, it is difficult to know the demand elasticity for the Lerner index while the concentration indicators needs to be distinguished between those stressing respectively the importance of the number of enterprises, their dimensional distribution or both the aspects (the Herfindhal index). The added value divided by the sales could be employed as an index of vertical integration. The second step is a comparison with the other countries in order to examine if the National Institutes of Statistics deal with this economic problem In particular the paper points out American, Canadian and French

experiences about this problem. The third step is the possibility of calculating these indicators with the data available in Istat. In order to do this, it is useful to identify the "relevant market", e.g. employing the criteria used by the Antitrust Authorities. It is necessary, in fact, to consider both economic and empirical problems. The main empirical problem that arises is the difficulty of integrating different statistical sources: in order to solve this problem, the Istat is working for the creation of "ASIA", (The Business Register of Active Enterprises). ASIA is an integrated register of statistical and administrative data in a dynamic context. The aim of the paper is to stimulate a discussion in order to find, if it is possible, a link between statistical and economic theory requirements.

THE IMPACT OF FINANCING CONSTRAINTS ON MARKUPS: THEORY AND EVIDENCE FROM ITALIAN FIRM LEVEL

Bottasso Anna CERIS-CNR

Galeotti Marzio, Università di Bergamo

Sembenelli Alessandro CERIS-CNR

In this paper we look at both the theoretical and empirical behaviour of price-cost margin capital market imperfections affect firms' markup policies. We present a model of a firm operating in an industry with differentiated products and facing imperfect markets for financing operations. The model results in an Euler equation for the optimal price path which is estimated using data for several hundreds Italian firms over period 1981-1993. The empirical results suggest that: (I) capital market imperfections are present in the sense that firms in our sample pay a premium on external finance which significantly depends on the debt to sale ratio; (II) according to our estimates constrained firms find optimal to cut price compared to unconstrained firms; (III) as firms are more likely to be financially constrained in recessions, our results imply that financial market imperfections tend to make markups procyclical.

A MEASURE OF ITALIAN ENTERPRISES PERMANENCE IN THE EUROPEAN UNION MARKET

Marasco Luigi Pompeo, ISTAT

Under the new economic arrangement, it is not enough to know export values, even though they have been satisfying in the last few years and it is therefore still necessary to support them with the behaviour of the leaders operating in the European Union Market.

The processes of integration require the enterprise system as well national administration to use a peculiar skill and care supporting intra-EU exports: both of them particularly directing to small and medium firms that characterize our productive structure and are excluded from the extradomestic market because of the lack of financial resources.

the exporting enterprise system services on behalf of ICE (the National Institute of Foreign Trade) are oriented to stabilize those firms in foreign markets which have been continuously exporting, for a long time, because the Institute cannot offer available resources to the all of them, but only to the ones which can get a feedback in terms of development and management export market shares.

This work aims to quote the average permanence of firms exporting in the EU market and the connected average export sale turnover per firm to determine a definite threshold, both in terms of export turnover and market presence, in order to keep separate the enterprises occasionally performing in European Community market from the permanent ones. The threshold quoted above should be regarded as a leading indicator to estimate public and private interference effect both general economic system and product sector standard and single enterprise standard.

In other words, it would be demonstrated that the Italian export undertaking consists of two different classes of firms: one represents the core export, the export performance of which is a part of each single enterprise strategy, this class is placed over the threshold; on the contrary, the other includes the enterprises with high birth and death rates on foreign market and points out a discontinuous export performance on behalf of every firm collocated under the leading threshold.

STOCHASTIC ANALYSIS OF OPPORTUNISTIC REPLACEMENT AND MAINTENANCE POLICIES FOR TWO-UNIT SERIES SYSTEMS

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INTRODUCTION In systems consisting of several stochastically failing parts, there often exists major dependency between components as far as their replacement, maintenance and repair are concerned. Thus, in a multi component system which has several stochastically failing parts and economics of scale in their maintenance, it may be advantageous to follow an opportunistic maintenance policy. By economics of scale, it is meant that a renewal action of one component could be performed at a lower cost in conjunction with other component (s) than when it is performed individually. Thus, in opportunistic policies, the action to be taken on a given part at a given time depends on the state of the rest of the system.

In this paper we have considered the following two models: **MODEL I** Consider a two-unit system where the units are arranged in series. A failure of either of the units will result in system failure and it gives an opportunity to replace or to perform maintenance of the other unit. The opportunistic replacement of a unit will depend on its age. If the

age of the unit under consideration is near to its actual age (as envisaged by age replacement policy of the unit) or exceeds a predetermined control limit age or screen as described by Karen and Marlin [4], then it goes for opportunistic replacement with probabilities P_1 and P_2 (depending upon their ages) respectively and undergo corrective maintenance with probability $(1-P_1)$ and $(1-P_2)$ respectively. It is assumed that all the corrective maintenance action are perfect, i.e., the unit are as good as new after maintenance. The failure time, repair time and maintenance time all have arbitrary distributions.

MODEL II Consider a system with two units connected in series. On failure of one unit the system stops and the failed unit is replaced, whereas the other unit is inspected for opportunistic replacement or corrective maintenance (c.m.). After corrective maintenance, the failure time distribution is different with failure rate more than the one for a new unit. It is assumed that the time for corrective maintenance or replacement is negligible. The above models are considered under the following assumptions :

ASSUMPTIONS 1) Hazard rate of the two units is continuous and monotonically increasing 2) All switching operations are perfect 3) All failure event are s - independent 4) The unit is as good as new after every maintenance. 5) All the random variables are mutually exclusive.

In the analysis of these models we have obtained : 1) Pointwise availability 2) Expected number of replacements during the interval $[0, t]$ 3) The expected number of maintenance of the units during the interval $[0, t]$ 4) Expected duration of repairs of the units in the interval $[0, t]$

Finally, a numerical example is considered for MODEL I to obtain a steady state availability of the system by considering increasing failure rate for the units.

CONCLUSION The decision of performing opportunistic maintenance or replacement of any of the units depends upon the age of the unit under consideration. In the models discussed, it is assumed that the probabilities P_1 and P_2 are predetermined. In a more appropriate model, P_1 and P_2 should be functions of the age of the units. For example, if at an occurrence of an opportunity, due to failure of a component, the other component should be considered for opportunistic replacement if it had already spent more than 80% of its replacement age so that the corresponding P_j would be 1.

TREND OF TOURIST FLOWS IN ITALIAN HOTELS: A MICRO-ECONOMIC ANALYSIS DURING THE PERIOD 1990-95

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Mirto Anna Pia, ISTAT

Istat spreads every month data on the number of arrivals and nights spent in the receptive accommodations (hotels and similar establishment and other collective accommodation establishments). The great number of studies about this topics, highly stimulated by the "Giubileo" in the year 2000 leads to a critical observation: what is the level of lacking of information which must be accepted referring to macrodata, instead of very heterogeneous microdata. The problem consists in comparing the virtual trend about the tourist variables, based on the calculation of the macro-aggregates, with the real data derived from the individual series. A longitudinal study is proposed, referring to the quarterly data crossing the period 1990-95, in which the units of analysis considered (Apt, Board of Tourist Promotion) are aggregations of elementary units (hotels) provided by the official monthly survey on the client movement. The basic hypothesis is that the growth or the reduction of ie nights spent involves not only monetary costs, but also costs deriving from the adaptation action: for example management of good storage, adaption of employment flows, fixed costs related to the location during the closing period for the hotels. The four main objectives of the present work are the followings: * to analyse the links between the night spent in time t (time reference period) and those ones referred to the previous time period t-1; * to analyse the variability of the previous measurements regarding to control variables as seasonality, trend, the level of attraction of the considered locality and the ratio between quality and cost for the nights spent; * to study the differences among macro-estimates and estimates at business level proposed in this contribution; * to study the possible existence of micro-structure by which estimating the macro trends. The proposed application seems the first on this topic at present available in the field of econometric studies on tourism. In formal terms we can define the following variables:

Pti/s nights spent at time t in the i-th Apt belonging to the status s SEAS_{t/s} coefficient of seasonality referred to time t and to stratus s TREND_t trend variable referred to time t Dt/s dummy variable referred to time t and to i-th Apt of the stratus s Qti/s quality index referred to time t of the i-th Apt of the stratus s Cti/s cost index referred to time t of the i-th Apt of the stratus s

The composition of stratus is deeply discussed in the paper. For every Apt this model of "partial adjustment has been estimated:

$$P_{ti/s} = l_i P_{t-1,i/s} + a_i SEAS_{t/s} + b_i TREND_t + g_i Dt/s + h_i Q_{ti/s} / C_{ti/s} + d_{it}$$

and it has been reiterated separately for the nights spent by Italian and foreign tourists. The coefficients of seasonality are calculated at stratus level and not at single Apt level, to guarantee a better statistical significance. The dummy variable assumes the values "1"

or "0" if the reference period t is favourable or unfavourable to the activation of tourist flows in the stratus s , in which this variable remains constant for every Apt of the stratus. Quality index has been estimated by an arithmetic mean of the number of bedplaces available during the reference period t and in the i -th Apt, the last one weighted by the relative number of stars. Cost index is available at regional level and it is given by the index of the cost for a night spent in a "typical" hotel accommodation establishment, available by an ISTAT survey on the prices. All the variables are expressed in logarithmic form, even if the result; obtained using the original variables are not very different, as it has been verified with an ex post comparison. Estimates have been examined through frequency distribution and suitable comparisons of average and median values, varying some control characters such as the size and the stratus of the APT, measured in terms of average amount of the inbound flows. A similar model has been estimated using aggregated macro-data available by Istat aggregate figures currently diffused, to underline the existing discordances among the estimates of the parameters obtained in this way and the estimates obtained by the average of the available estimates at Apt level. The final results, largely discussed in this paper, have stressed the risk in using aggregations of elementary units not always coherent and have confirmed the higher seasonal flexibility of economic small size units. On the other hand, parameter estimates calculated by the two techniques do not differ in a consistent measure

Assessing slacks through a nested radial approach in an FDH technology.

Pavone Antonio, ISTAT

Destefanis Sergio Università degli studi di Salerno

ESTIMATION OF UNOBSERVED INCOME FOR HOMOGENEOUS AGRICULTURAL FIRMS, USING AN ECONOMETRIC MODELING APPROACH.

Pizzoli Edoardo, ISTAT

Orsini Marco, ISTAT

In recent years an increasing number of microdata on fundamental statistical units, as industrial and agricultural firms, or public and private institutions, are available from administrative databases and national censuses. The main problems dealing with these data are due to errors and biases in the variables, non coincidence of the population observed by alternative sources, and, finally, relevant structural differences in at first sight homogeneous units. This kind of problems are also met in the ASIA project, that is the project to implement a new statistical database of active firms in Italy, of the National Institute of Statistic (ISTAT). This paper, looking for a solution strategy in the ASIA-

Agriculture context, moves towards two directions. First, we classify agricultural firms in a number of strata, making use of a-priori information (macro-zones and products classification) and cluster analysis technique. At this stage we identify some measurement errors in the structural variables and a systematic bias of observed income. Second, we estimate a cross-section income model for each strata of homogeneous firms, to get a theoretical value of this (partially) unobserved economic variable. In this way we are able to identify several class of firms in relation to their income, as expected from their structural characteristics.

BANKRUPTCY IN ITALY

Urbano Annamaria, ISTAT

Bankruptcy of a commercial company forms part of "iprocure concorsuali" and represents the final stage of economic crisis or financial difficulty that can affect an entrepreneur. Commercial company's economic crisis takes on high importance because it concerns not only creditors of company in question, but, as a consequence, the all economy too. In fact bankruptcy of one company can cause bankruptcy of other ones with large credits towards the first company and so on. This produces repercussions on an economic system employment level, too. It is a long time that ISTAT makes a survey on companies' bankruptcy declarations. It is an administrative survey because the corresponding forms are filled up for each bankruptcy by people working at Record Offices of Civil Courts of Justice. These forms collect a series of information such as: date of declaration sentence of bankruptcy, date of company's birth, province and commune where company is placed, juridical form, field of economic activity, fiscal code and so on. The presence of fiscal code allows to use bankruptcy data in order to update Statistical Register of Active Firms (ASIA). In this way it becomes possible the linkage with other business registers, capturing additional information. As a consequence a careful economic analysis about companies' financial crisis can be done. This work describes advantages, information gain and some synthetic results deriving from above mentioned linkage. Paper deals with temporal dynamics of firms' bankruptcies on the basis of bankruptcy quotients or crisis indexes concerning different times. These indexes are calculated making the ratio between the number of bankruptcies reported during a period to the number of companies active at 31 December of the year before. This number is taken from the Register of births and deaths of Italian Companies, managed by InfoCamere. If the above mentioned quotients record positive per cent variations it means that there is higher propensity to bankruptcy during the examined period. An opposite situation happens if bankruptcy quotients assume negative variations. Paper examines how bankruptcy quotients change according different geographical areas, juridical form and field of economic activity concerning the bankrupt firm. Some structural characteristics of firms gone bankrupt in 1996 will be analysed, considering also firm's age, person who required the bankruptcy and the seasonal trend of phenomenon based on observation of month of bankruptcy declaration. Through examination of bankruptcy quotients paper will try to outline the typology of a bankrupt firm in order to put in evidence a different economic reliability as regards juridical form, field of economic activity and geographical areas.